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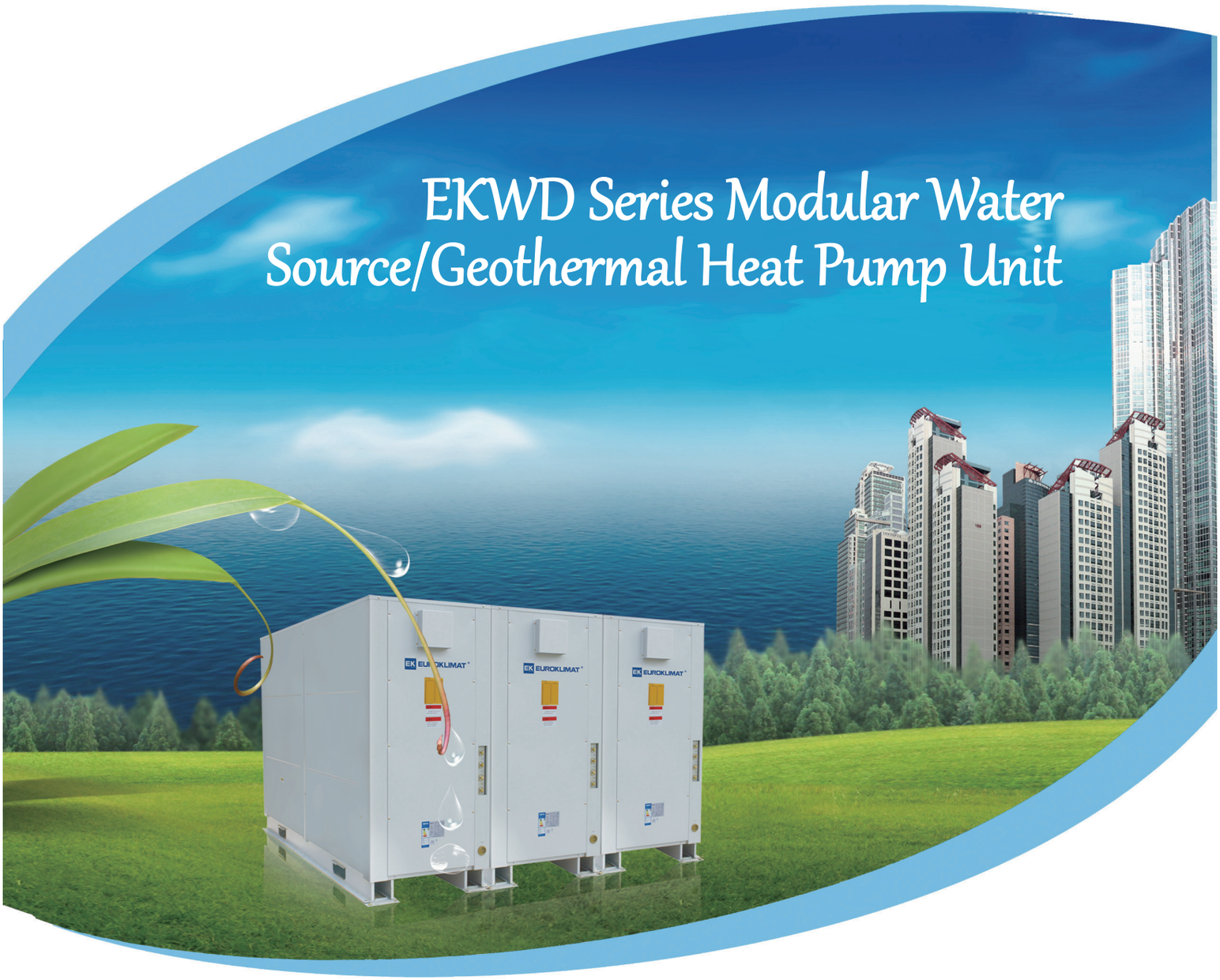
EKWD Series Modular Water Source/Geothermal Heat Pump Unit



EKWD Series Modular Water Source/ Geothermal Heat Pump Unit

Basic modules: EKWD021CR
EKWD032CR
EKWD043CR

www.euroklimat.com

EUROKLIMAT®

EUROKLIMAT Air Conditioner, Environmental & Energy-saving Technology from Europe.

EUROKLIMAT (EK) was established in 1963 in Italy. For the past half a century, it has become famous as an energy-saving air-conditioning manufacturer in Italy and globally. Continuous innovation, new product development and top manufacturing quality are the driving force behind this growth.

EUROKLIMAT (EK) pursues the ideals of protecting the environment, providing physical comfort and adopting energy-saving into the whole process of product R&D, manufacturing and service. Our products covering residential, commercial and close control air-conditioner are manufactured according to the global generally accepted standards.

AVIC Radar and Avionics Equipment Research Institute in 2012

ISO9001: 2008 corporate certification

ISO14001: 2004 Environmental management system certification

Product Manufacturing License (XK06-015-00361)

CNAS L5123

State-certified Lab

Swimming pool of Qinzhou Stadium in 2011

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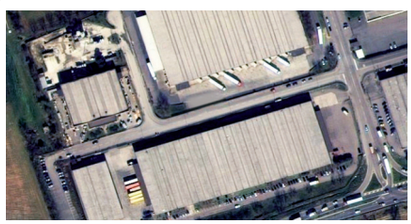
EUROKLIMAT®

Forty-nine years of Air-conditioning

Chengshi Yingxiong e-game chain store in 2009

EUROKLIMAT®



EK Italia Headquarters

Guangzhou Wanjia Clothing Wholesale Market in 2010

Liuzhou Diwang International Business Center in 2011

Shenyang Bayi Theatre in 2010

Guangzhou Tobacco Building in 2010

Library of Shanxi University in 2011

Guangxi University for Nationalities in 2009

Wahaha Group in 2011

Baoshen Railway in 2009

EKWD Series Modular Water Source/Geothermal Heat Pump Unit

With the help of over 40 years of experience in design of air conditioner units, EK combined the advantages of water source heat pump systems and heat recycler systems to launch the first modular water cooled air conditioner (water source heat pump) unit in the industry, that is, EKWD series modular water source/geothermal heat pump unit. This series unit can work in water chilling mode, water source heat pump mode, water source heat pump + hot water mode, cooling + hot water mode, and hot water mode, thereby meeting customer needs for multiple purposes, energy efficiency, stability, reliability, intelligent control, flexibility, and comfort.

DLR European Space Agency

- In 1912, the water source/geothermal heat pump technology was born in Sweden and patented.
- In the 1950s, countries in Europe and North America started researching into the usage of the water source/geothermal heat pump technology.
- In the 1970s, the water source/geothermal heat pump technology research progressed dramatically because of the oil crisis and ever-deteriorating environment.
- In 1978, EK water source/geothermal heat pumps were launched in Europe and won unanimous acclamation.
- In 2000, EK joined hand with the DLR European Space Agency to research into the water source/geothermal heat pump technology.
- In 2009, EK China introduced the leading-edge water source/geothermal heat pump technologies to launch the EKWD series modular water source/geothermal heat pump units.

Nomenclature

EKWD	043	C	R	SQ	M - F	AA	E
1	2	3	4	5	6 7	8	9

1.	EKWD	EKWD modular water source/geothermal heat pump units
2.	043	Unit Capacity Code
3.	C	Design SN
4.	R	R: heat pump unit
5.	SQ	SQ: standard model for water circulation conditions SG: standard model for underground water conditions SD: standard model for underground circulation conditions QR: standard total heat recovery model for water circulation conditions GR: standard total heat recovery model for underground water conditions DR: standard total heat recovery model for underground circulation conditions QV: standard dual-condenser total heat recovery model for water circulation conditions GV: standard dual-condenser total heat recovery model for underground water conditions DV: standard dual-condenser total heat recovery model for underground circulation conditions
6.	M	Unit Features: M: master unit; S: slave unit
7.	F	Power supply: F: 380V/3N~/50Hz
8.	AA	Detailed description of product specification changes
9.	E	E for export; mainland China by default

For users, water source/geothermal modules are…

- **More Efficient**
  The modular water source/geothermal unit supports applications in all conditions and can switch between multiple modes to fully meet user needs for cooling, heating, and hot water. With an innovative water system, the energy-saving unit delivers an EER as high as 5.7, provides higher energy efficiency when working at a partial workload, and saves energy by 50% compared with other systems after operation in a year.
- **More Comfortable**
  The unit is designed with a comprehensive water system and consists of efficient components carefully selected and designed for a low operation noise. The unit supports fuzzy volume regulation for a narrow range of temperature changes and quickly reaches the set temperature.
  In addition, the unit provides hot water at a set temperature as high as 55°C quickly and steadily to meet requirements for comfortable hot water in all places.
- **More Reliable**
  With modular design, the unit starts step by step, reducing the shock on the grid, and maintenance of a single unit does not affect running of other units. In addition, the unit provides multiple built-in security protection functions, and supports intelligent and centralized control, facilitating daily management.
- **More Energy Saving**
  The leading-edge shell design allows the unit to be installed in an outdoor space such as terrace and rooftop without the need of a dedicated room. The unit delivers a long lifecycle and runs for long. Units may be installed in batches according to project progress. One water system that works in multiple modes saves investment on other devices such as heating and hot water supply devices, thereby saving the energy.

For the institute, water source/geothermal modules provide the following benefits:

- **Convenient Model Selection**
  The 32RT and 43RT basic modules support free combination of master units and slave units to form 1 to 16 units, providing as many as 153 solutions for a cooling capacity as high as 688RT.
- **Easy Switching**
  The unit sends control signals to valves of the water system to easily switch between the water source/geothermal heat pump mode, heat recovery mode, and water heater mode, meeting requirements for cooling, heating, and hot water around the clock.
- **Variable Water Flow Design**
  The unit easily implements variable primary flow pumping, which helps the central air conditioning system save energy by 30%.

For the installation company, water source/geothermal modules provide the following benefits:

- **Easy Transportation**
  The modular design allows transportation by using elevators and manual forklifts and eliminates the need for hoisting.
- **Easy Installation**
  The modular design allows units to be moved separately and assembled, facilitating installation work.

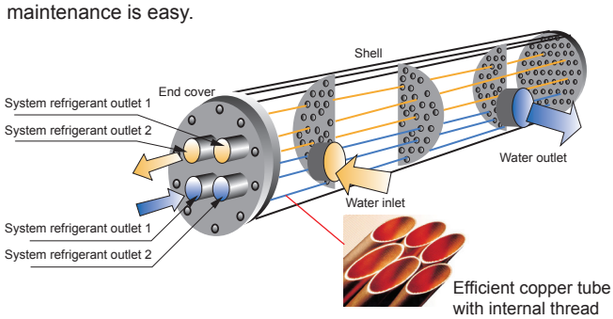
Efficient and Energy Saving – Saving Electricity and Money >>>

Unit with Less Energy Consumption

The unit works with efficient volute compressors, shell-and-tube condensers, and dry evaporators, and is carefully designed by EK experts upon strict comprehensive tests for model selection. This ensures that the unit works in a least energy consuming way. The unique evaporator structure and efficient compressor technologies allow the unit to reach an EER as high as 5.7 when working at full workload and to save more energy at a partial workload.

Heat exchanger

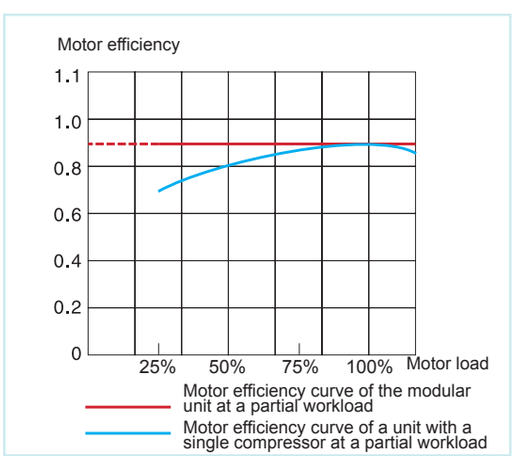
The evaporator and condenser use efficient heat exchange copper tubes for thorough evaporation and condensing and a higher efficiency. A baffle plate is mounted inside the evaporator to change the water flow direction, further enhancing heat exchange. The system flow structure is simple, heat exchange is stable, and maintenance is easy.



Efficient evaporator for EK air conditioner

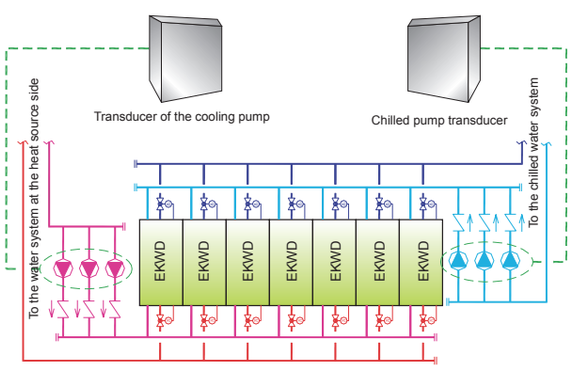
Combinations for Less Energy Consumption

Combinations of modules allow volume regulation for more steps and support precise control by 11RT at each step. This helps the unit stay in the optimal energy conservation state and work efficiently around the clock.



System with Less Energy Consumption

The control system of the unit sends out intelligent control signals for the cooling tower, cooling water pumps, and chilled water pumps, automatically regulates the temperature of the cooling water by controlling the fan of the cooling tower, and reduces energy consumption of the cooling water tower. This enables automatic flow control for pumps in line with the transducer, which helps the central air conditioning system save energy by 30%.



Reliable Performance – Safe and Comfortable >>>

Stable Performance

The unit is built with pressure protection, antifreeze protection, overload protection for compressors, and water flow protection, ensuring security of the unit. The system provides the self diagnosis function. The controller sends an alert upon a fault and displays the fault code.

Reliable Running

The unit centralizes system management functions, adopts a modular structure, and starts step by step, reducing the shock on the grid. The unit ensures balanced wear for compressors, which increases its lifecycle. Failure of a single compressor in the unit does not affect normal running of other units. Repair and maintenance work of a single unit do not affect running of other units.

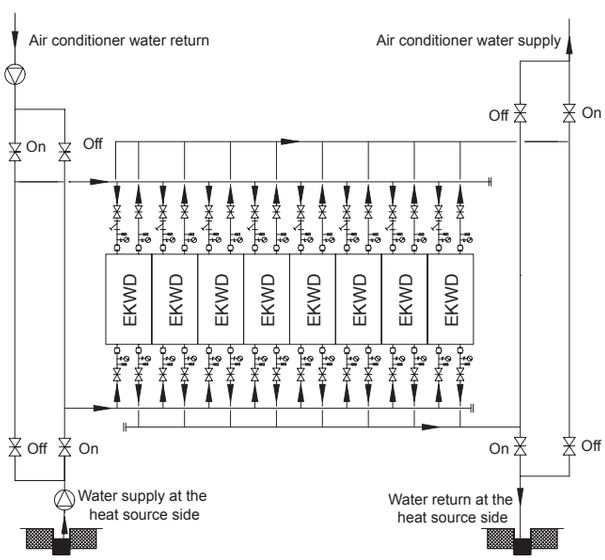
Healthy and Comfortable

The unit can implement fuzzy volume regulation according to the set temperature to ensure a narrow range of temperature fluctuation. The unit adopts vibration isolation technologies and multi-plenum noise reduction techniques for strict comparison, selection, and improvement of components. Professional noise reduction design for the structure and pipeline ensures leading-edge vibration and noise performance of the unit.

Flexible Design for More Convenient Installation >>>

More Convenient Installation

The unit adopts shell design and does not require a dedicated equipment room. It may be installed at any proper place indoors, outdoors, or at rooftop. The shell adopts powder spraying technique with anti-UV coating materials, which fade slowly over a long time and greatly improve anti-erosive capabilities. The unit is small and compact, and may be moved by using an elevator or manual forklift. No professional hoisting devices are required, saving installation expenses. Combinations can be formed with little space during installation, reducing the land area required for placing the device.

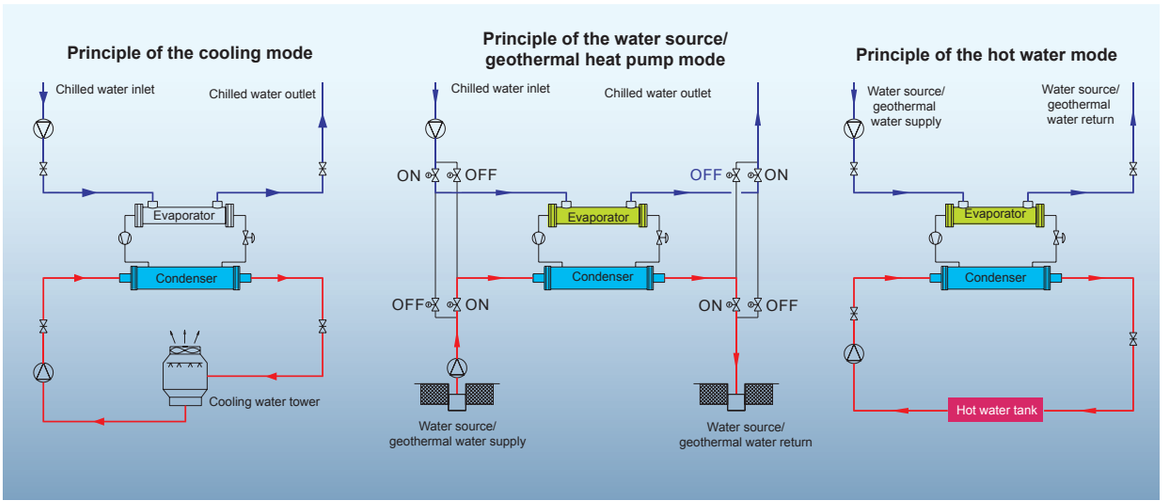


More Flexible Investment

Modules and relevant devices may be added up at any time according to changes of the application environment, thereby saving initial investment and operating expenses. A design margin is not required during model selection of the master unit, which may be increased at any time. This reduces wastes.

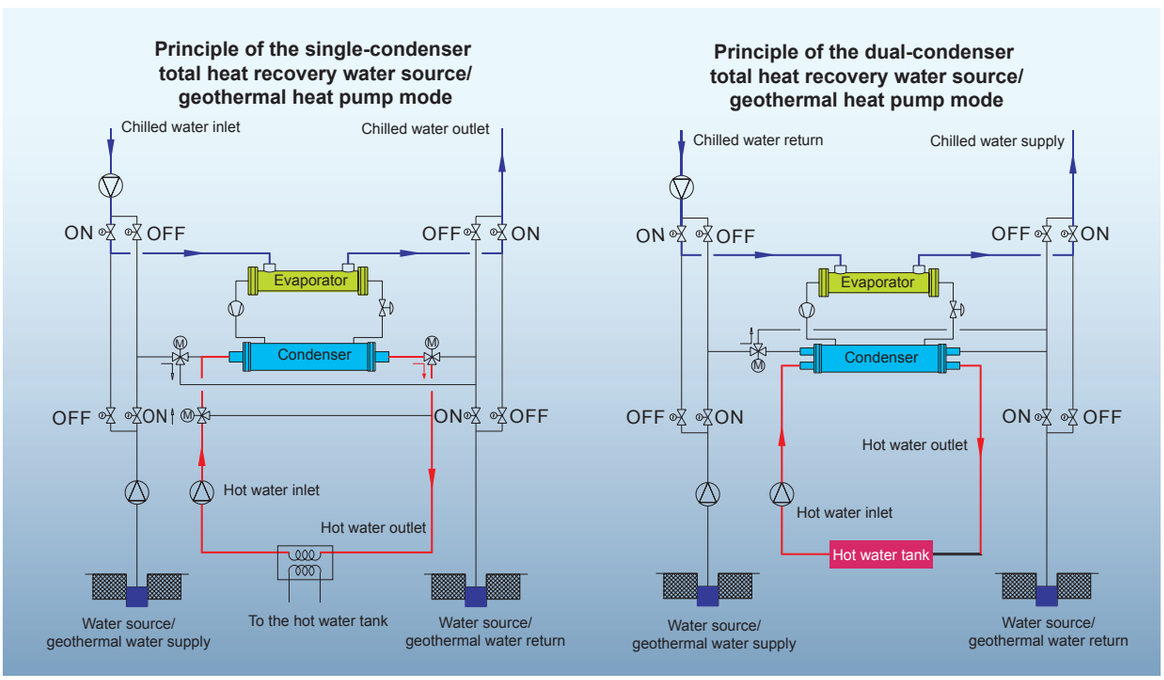
Multiple Applications for Higher Energy Efficiency >>>

Easy switching



Heat recovery

The unit is applicable to heat recovery scenarios. It performs precise monitoring on the temperature of the heat recovery circular water (circular water of the condenser), automatically outputs signals, and controls switching between cooling water and heat recovery circular water, thereby implementing optimal heat recovery.



SQ standard model for chilled water circulation

Basic modules				EKWD021CRSQ	EKWD032CRSQ	EKWD043CRSQ
Cooling mode	Nominal Cooling Capacity		kW	74	110	150
	Total Power of Nominal Cooling Capacity		kW	14	22.3	30.1
	Water flow	Evaporator	m³/h	12.7	18.9	25.8
		Condenser	m³/h	15.1	22.8	30.9
Water pressure drop	Evaporator		kPa	21	30	30
	Condenser		kPa	17	19	19
Heat exchanger type	Evaporator type			Plate	Shell-and-tube	
	Condenser type			Shell-and-tube		
Recommended total pipe diameter	Evaporator		mm	DN65	DN65	DN80
	Condenser		mm	DN65	DN65	DN80
Volume Adjustment	Steps			2	3	4
	Regulation mode			Fuzzy control		
Compressor	Model			Fully hermetic volute		
	Lubricant			Mineral oil (SUNISO 3GS)		
Refrigerant	Flow control method			Electronic expansion valve		
	Category			R22		
Dimensions	L x H x W		mm	1647x1202x632	2247x1498x710	
Unit weight	Net weight		kg	452	703	887
	Transportation weight		kg	478	738	922

Notes: Test conditions for the unit are as follows:

- Test conditions for nominal cooling capacity: inlet chilled water temperature at the application side 12°C; outlet chilled water temperature at the application side 7°C; inlet cooling water temperature at the heat source side 30°C; outlet chilled water temperature at the heat source side 35°C.
- The water main of the assembled unit needs to be made and mounted on site, and the diameter needs to comply with the design specification.
- The attached Y-shaped filter must be mounted at the water inlet of the evaporator of each unit.
- The cooling water and chilled water of the unit must be softened to avoid scaling in the heat exchanger.
- The water pressure drop of the unit does not include resistance of any external water pipe or component.
- Basic modules of the assembled unit are EKWD032CRSQM/SM/S and EKWD043CRSQM/SM/S. A unit may be formed by modules of the same model or different models.
- Product specifications are subject to change due to upgrade without further notice.

SQ standard model for water circulation conditions

Basic modules				EKWD021CRSQ	EKWD032CRSQ	EKWD043CRSQ
Water Circulation Mode	Nominal Cooling Capacity		kW	74	110	150
	Nominal Heating Capacity		kW	89	148	200
	Total Power of Nominal Cooling Capacity		kW	14.0	22.3	30.1
	Total Power of Nominal Heating Capacity		kW	17.2	28.5	37.4
	Water flow	Application side	m³/h	12.7	18.9	25.8
		Heat source side	m³/h	15.1	22.8	30.9
Water pressure drop	Application side (air conditioner side)		kPa	21	30	30
	Heat source side		kPa	17	19	19
Heat exchanger type	Application side (evaporator)			Plate	Shell-and-tube	
	Heat source side (condenser)			Shell-and-tube		
Recommended total pipe diameter	Evaporator		mm	DN65	DN65	DN80
	Condenser		mm	DN65	DN65	DN80
Volume Adjustment	Steps			2	3	4
	Regulation mode			Fuzzy control		
Compressor	Model			Fully hermetic volute		
	Lubricant			Mineral oil (SUNISO 3GS)		
Refrigerant	Flow control method			Electronic expansion valve		
	Category			R22		
Dimensions	L x H x W		mm	1647x1202x632	2247x1488x710	
Unit weight	Net weight		kg	452	703	887
	Transportation weight		kg	478	738	922

Notes: Test conditions for the unit are as follows:

- Test conditions for nominal cooling capacity: inlet chilled water temperature at the application side 12°C; outlet chilled water temperature at the application side 7°C; inlet cooling water temperature at the heat source side 30°C; outlet chilled water temperature at the heat source side 35°C.
- Test conditions for nominal heating capacity: inlet/outlet water temperature at the application side 40/-°C, and rated water flow at the application side for nominal cooling; inlet/outlet water temperature at the heat source side 20/-°C, and rated water flow at the heat source side for nominal cooling.
- Switching between the cooling and heating modes is implemented through an external valve connected to the water system. The unit provides a interface for controlling the electric valve.
- The water main of the assembled unit needs to be made and mounted on site, and the diameter needs to comply with the design specification.
- The attached Y-shaped filter must be mounted at the water inlet of the evaporator of each unit.
- The cooling water and chilled water of the unit must be softened to avoid scaling in the heat exchanger.
- The water pressure drop of the unit does not include resistance of any external water pipe or component.
- Basic modules of the assembled unit are EKWD032CRSQM/S and EKWD043CRSQM/S. A unit may be formed by modules of the same model or different models.
- Product specifications are subject to change due to upgrade without further notice.

SD standard model for underground circulation conditions

Basic modules				EKWD021CRSD	EKWD032CRSD	EKWD043CRSD
Underground circulation mode	Nominal Cooling Capacity		kW	76	113	153
	Nominal Heating Capacity		kW	79	115	159
	Total Power of Nominal Cooling Capacity		kW	13	20.4	27.2
	Total Power of Nominal Heating Capacity		kW	16.8	26.0	34.3
	Water flow	Application side	m^3/h	13.1	19.4	26.3
		Heat source side	m^3/h	15.3	22.9	31.0
Water pressure drop	Application side (air conditioner side)		kPa	19	35	32
	Heat source side		kPa	26	20	19
Heat exchanger type	Application side (evaporator)			Plate	Shell-and-tube	
	Heat source side (condenser)			Shell-and-tube		
Recommended total pipe diameter	Evaporator		mm	DN65	DN65	DN80
	Condenser		mm	DN65	DN65	DN80
Volume Adjustment	Steps			2	3	4
	Regulation mode			Fuzzy control		
Compressor	Model			Fully hermetic volute		
	Lubricant			Mineral oil (SUNISO 3GS)		
Refrigerant	Flow control method			Electronic expansion valve		
	Category			R22		
Dimensions	L x H x W		mm	1647x1202x632	2247x1488x710	
Unit weight	Net weight		kg	452	703	887
	Transportation weight		kg	478	738	922

Notes: Test conditions for the unit are as follows:

- Test conditions for nominal cooling capacity: inlet chilled water temperature at the application side 12°C; outlet chilled water temperature at the application side 7°C; inlet cooling water temperature at the heat source side 25°C; outlet chilled water temperature at the heat source side 30°C.
- Test conditions for nominal heating capacity: inlet/outlet water temperature at the application side 40/-°C, and rated water flow at the application side for nominal cooling; inlet/outlet water temperature at the heat source side 7/-°C, and rated water flow at the heat source side for nominal cooling.
- Switching between the cooling and heating modes is implemented through an external valve connected to the water system. The unit provides a interface for controlling the electric valve.
- The water main of the assembled unit needs to be made and mounted on site, and the diameter needs to comply with the design specification.
- The attached Y-shaped filter must be mounted at the water inlet of the evaporator of each unit.
- The cooling water and chilled water of the unit must be softened to avoid scaling in the heat exchanger.
- The water pressure drop of the unit does not include resistance of any external water pipe or component.
- Basic modules of the assembled unit are EKWD032CRSQM/S and EKWD043CRSQM/S. A unit may be formed by modules of the same model or different models.
- Product specifications are subject to change due to upgrade without further notice.

SG standard model for underground water conditions

Basic modules				EKWD021CRSG	EKWD032CRSG	EKWD043CRSG
Underground water mode	Nominal Cooling Capacity		kW	77	115	154
	Nominal Heating Capacity		kW	84	128	169
	Total Power of Nominal Cooling Capacity		kW	13.5	20.0	27.0
	Total Power of Nominal Heating Capacity		kW	17.2	27.0	35.6
	Water flow	Application side	m³/h	13.2	19.8	26.4
		Heat source side	m³/h	7.1	10.6	14.1
Water pressure drop	Application side (air conditioner side)		kPa	21	37	32
	Heat source side		kPa	7	6	2
Heat exchanger type	Application side (evaporator)			Plate	Shell-and-tube	
	Heat source side (condenser)			Shell-and-tube		
Recommended total pipe diameter	Evaporator		mm	DN65	DN65	DN80
	Condenser		mm	DN50	DN65	DN80
Volume Adjustment	Steps			2	3	4
	Regulation mode			Fuzzy control		
Compressor	Model			Fully hermetic volute		
	Lubricant			Mineral oil (SUNISO 3GS)		
Refrigerant	Flow control method			Electronic expansion valve		
	Category			R22		
Dimensions	L x H x W		mm	1647x1202x632	2247x1488x710	
Unit weight	Net weight		kg	452	703	887
	Transportation weight		kg	478	738	922

Notes: Test conditions for the unit are as follows:

- Test conditions for nominal cooling capacity: inlet chilled water temperature at the application side 12°C; outlet chilled water temperature at the application side 7°C; inlet cooling water temperature at the heat source side 18°C; outlet chilled water temperature at the heat source side 29°C.
- Test conditions for nominal heating capacity: inlet/outlet water temperature at the application side 40/-°C, and rated water flow at the application side for nominal cooling; inlet/outlet water temperature at the heat source side 15/-°C, and rated water flow at the heat source side for nominal cooling.
- Switching between the cooling and heating modes is implemented through an external valve connected to the water system. The unit provides a interface for controlling the electric valve.
- The water main of the assembled unit needs to be made and mounted on site, and the diameter needs to comply with the design specification.
- The attached Y-shaped filter must be mounted at the water inlet of the evaporator of each unit.
- The cooling water and chilled water of the unit must be softened to avoid scaling in the heat exchanger.
- The water pressure drop of the unit does not include resistance of any external water pipe or component.
- Basic modules of the assembled unit are EKWD032CRSQM/S and EKWD043CRSQM/S. A unit may be formed by modules of the same model or different models.
- Product specifications are subject to change due to upgrade without further notice.

QR/QV standard model for water circulation conditions

Basic modules				EKWD021CRQR/QV	EKWD032CRQR/QV	EKWD043CRQR/QV
Water Circulation Mode	Nominal Cooling Capacity		kW	74	110	150
	Nominal Heating Capacity		kW	89	148	200
	Total Power of Nominal Cooling Capacity		kW	14.0	22.3	30.0
	Total Power of Nominal Heating Capacity		kW	17.2	28.5	37.4
	Water flow	Application side	m³/h	12.7	18.9	25.8
		Heat source side	m³/h	15.1	22.8	30.9
Heat Recovery Mode	Nominal Cooling Capacity		kW	66	100	135.5
	Nominal Heat Recovery Capacity		kW	83	126	170
	Total Nominal Power		kW	17	26	34.5
	Nominal water flow at the heat recovery side		m³/h	14.3	21.7	29.2
	Nominal water flow at the evaporation side		m³/h	12.7	18.9	25.8
Water heater mode	Nominal Heating Capacity		kW	81	135	184
	Total Nominal Power		kW	19.1	32.1	43.5
	Nominal water flow at the hot water side		m³/h	14.3	21.7	29.2
	Water flow at the heat source side (evaporation side)		m³/h	15.1	22.8	30.9
Water pressure drop	Application side (air conditioner side)		kPa	21	30	30
	Heat source side		kPa	17	19	19
Heat exchanger type	Application side (evaporator)			Plate	Shell-and-tube	
	Heat source side (condenser)			Shell-and-tube		
Recommended total pipe diameter	Evaporator		mm	DN65	DN65	DN80
	Condenser		mm	DN65	DN65	DN80
Volume Adjustment	Steps			2	3	4
	Regulation mode			Fuzzy control		
Compressor	Model			Fully hermetic volute		
	Lubricant			Mineral oil (SUNISO 3GS)		
Refrigerant	Flow control method			Electronic expansion valve		
	Category			R22		
Dimensions	L x H x W		mm	1647x1202x632	2247x1488x710	
Unit weight	Net weight		kg	452(517)	703(818)	887(1040)
	Transportation weight		kg	478(543)	738(853)	922(1075)

Notes: Test conditions for the unit are as follows:

- Test conditions for nominal cooling capacity: inlet chilled water temperature at the application side 12°C; outlet chilled water temperature at the application side 7°C; inlet cooling water temperature at the heat source side 30°C; outlet chilled water temperature at the heat source side 35°C.
- Test conditions for nominal heating capacity: inlet/outlet water temperature at the application side 40/-°C, and rated water flow at the application side for nominal cooling; inlet/outlet water temperature at the heat source side 20/-°C, and rated water flow at the heat source side for nominal cooling.
- Test conditions for the heat recovery mode: inlet/outlet water temperature at the heat recovery side 40/45°C; inlet/outlet chilled water temperature at the application side 12/-°C, and rated water flow at the application side for nominal cooling.
- Test conditions for the water heater mode: inlet/outlet water temperature at the hot water side (application side) 50/-°C, and rated water flow at the heat recovery side for heat recovery conditions; inlet/outlet water temperature at the heat source side (evaporation side) 20/-°C; rated water flow at the heat source side for nominal cooling.
- Switching between the cooling, heating, water heater, and heat recovery modes is implemented through an external valve connected to the water system. The unit provides a interface for controlling the electric valve.
- The water main of the assembled unit needs to be made and mounted on site, and the diameter needs to comply with the design specification.
- The attached Y-shaped filter must be mounted at the water inlet of the evaporator of each unit.
- The net weight in brackets indicates the weight of a dual-condenser heat recovery unit.
- The cooling water and chilled water of the unit must be softened to avoid scaling in the heat exchanger.
- The water pressure drop of the unit does not include resistance of any external water pipe or component.
- Basic modules of the assembled unit are EKWD032CRQRM/S, EKWD043CRQRM/S, EKWD032CRQVM/S, and EKWD043CRQVM/S. A unit may be formed by modules of the same model or different models.
- Product specifications are subject to change due to upgrade without further notice.

DR/DV standard model for underground circulation conditions

Basic modules				EKWD021CRDR/DV	EKWD032CRDR/DV	EKWD043CRDR/DV
Underground circulation mode	Nominal Cooling Capacity		kW	76	113	153
	Nominal Heating Capacity		kW	79	115	159
	Total Power of Nominal Cooling Capacity		kW	13	20.4	27.2
	Total Power of Nominal Heating Capacity		kW	16.8	26.0	34.3
	Water flow	Application side	m³/h	13.1	19.4	26.3
		Heat source side	m³/h	15.3	22.9	31.0
Heat Recovery Mode	Nominal Cooling Capacity		kW	67.7	102	137
	Nominal Heat Recovery Capacity		kW	85	128	172
	Total Nominal Power		kW	17.3	26	35.0
	Nominal water flow at the heat recovery side		m³/h	14.6	22.0	29.6
	Nominal water flow at the evaporation side		m³/h	13.1	19.4	26.3
Water heater mode	Nominal Heating Capacity		kW	72	109	146
	Total Nominal Power		kW	20	30.6	41.0
	Nominal water flow at the hot water side		m³/h	14.6	22.0	29.6
	Water flow at the heat source side (evaporation side)		m³/h	15.3	22.9	31.0
Water pressure drop	Application side (air conditioner side)		kPa	19	35	32
	Heat source side		kPa	26	20	19
Heat exchanger type	Application side (evaporator)			Plate	Shell-and-tube	
	Heat source side (condenser)			Shell-and-tube		
Recommended total pipe diameter	Evaporator		mm	DN65	DN65	DN80
	Condenser		mm	DN65	DN65	DN80
Volume Adjustment	Steps			2	3	4
	Regulation mode			Fuzzy control		
Compressor	Model			Fully hermetic volute		
	Lubricant			Mineral oil (SUNISO 3GS)		
Refrigerant	Flow control method			Electronic expansion valve		
	Category			R22		
Dimensions	L x H x W		mm	1647x1202x632	2247x1488x710	
Unit weight	Net weight		kg	452(517)	703(818)	887(1040)
	Transportation weight		kg	478(543)	738(853)	922(1075)

Notes: Test conditions for the unit are as follows:

- Test conditions for nominal cooling capacity: inlet chilled water temperature at the application side 12°C; outlet chilled water temperature at the application side 7°C; inlet cooling water temperature at the heat source side 25°C; outlet chilled water temperature at the heat source side 30°C.
- Test conditions for nominal heating capacity: inlet/outlet water temperature at the application side 40/-°C, and rated water flow at the application side for nominal cooling; inlet/outlet water temperature at the heat source side 7/-°C, and rated water flow at the heat source side for nominal cooling.
- Test conditions for the heat recovery mode: inlet/outlet water temperature at the heat recovery side 40/45°C; inlet/outlet chilled water temperature at the application side 12/-°C, and rated water flow at the application side for nominal cooling.
- Test conditions for the water heater mode: inlet/outlet water temperature at the hot water side (application side) 50/-°C, and rated water flow at the heat recovery side for heat recovery conditions; inlet/outlet water temperature at the heat source side (evaporation side) 7/-°C; rated water flow at the heat source side for nominal cooling.
- Switching between the cooling, heating, water heater, and heat recovery modes is implemented through an external valve connected to the water system. The unit provides a interface for controlling the electric valve.
- The water main of the assembled unit needs to be made and mounted on site, and the diameter needs to comply with the design specification.
- The attached Y-shaped filter must be mounted at the water inlet of the evaporator of each unit.
- The net weight in brackets indicates the weight of a dual-condenser heat recovery unit.
- The cooling water and chilled water of the unit must be softened to avoid scaling in the heat exchanger.
- The water pressure drop of the unit does not include resistance of any external water pipe or component.
- Basic modules of the assembled unit are EKWD032CRQRM/S, EKWD043CRQRM/S, EKWD032CRQVM/S, and EKWD043CRQVM/S. A unit may be formed by modules of the same model or different models.
- Product specifications are subject to change due to upgrade without further notice.

GR/GV standard model for underground water conditions

Basic modules				EKWD021CRGR/GV	EKWD032CRGR/GV	EKWD043CRGR/GV
Underground water mode	Nominal Cooling Capacity		kW	77	115	154
	Nominal Heating Capacity		kW	84	128	169
	Total Power of Nominal Cooling Capacity		kW	13.0	20.0	27.0
	Total Power of Nominal Heating Capacity		kW	17.2	27.0	35.6
	Water flow	Application side	m³/h	13.2	19.8	26.4
		Heat source side	m³/h	7.0	10.6	14.1
Heat Recovery Mode	Nominal Cooling Capacity		kW	67.7	102	137
	Nominal Heat Recovery Capacity		kW	85	128	172
	Nominal water flow at the heat recovery side		m³/h	14.6	22.0	29.6
	Nominal water flow at the evaporation side		m³/h	13.2	19.8	26.4
Water heater mode	Nominal Heating Capacity		kW	82	123	166
	Total Nominal Power		kW	20.8	31.3	42.0
	Nominal water flow at the hot water side		m³/h	14.6	22.0	29.6
	Water flow at the heat source side (evaporation side)		m³/h	7.0	10.6	14.1
Water pressure drop	Application side (air conditioner side)		kPa	21	37	32
	Heat source side		kPa	7	6	2
Heat exchanger type	Application side (evaporator)			Plate	Shell-and-tube	
	Heat source side (condenser)			Shell-and-tube		
Recommended total pipe diameter	Evaporator		mm	DN65	DN65	DN80
	Condenser		mm	DN50	DN65	DN80
Volume Adjustment	Steps			2	3	4
	Regulation mode			Fuzzy control		
Compressor	Model			Fully hermetic volute		
	Lubricant			Mineral oil (SUNISO 3GS)		
Refrigerant	Flow control method			Electronic expansion valve		
	Category			R22		
Dimensions	L x H x W		mm	1647x1202x632	2247x1488x710	
Unit weight	Net weight		kg	452(517)	703(818)	887(1040)
	Transportation weight		kg	478(543)	738(853)	922(1075)

Notes: Test conditions for the unit are as follows:

- Test conditions for nominal cooling capacity: inlet chilled water temperature at the application side 12°C; outlet chilled water temperature at the application side 7°C; inlet cooling water temperature at the heat source side 18°C; outlet chilled water temperature at the heat source side 19°C.
- Test conditions for nominal heating capacity: inlet/outlet water temperature at the application side 40/-°C, and rated water flow at the application side for nominal cooling; inlet/outlet water temperature at the heat source side 15/-°C, and rated water flow at the heat source side for nominal cooling.
- Test conditions for the heat recovery mode: inlet/outlet water temperature at the heat recovery side 40/45°C; inlet/outlet chilled water temperature at the application side 12/-°C, and rated water flow at the application side for nominal cooling.
- Test conditions for the water heater mode: inlet/outlet water temperature at the hot water side (application side) 50/-°C, and rated water flow at the heat recovery side for heat recovery conditions; inlet/outlet water temperature at the heat source side (evaporation side) 15/-°C; rated water flow at the heat source side for nominal cooling.
- Switching between the cooling, heating, water heater, and heat recovery modes is implemented through an external valve connected to the water system. The unit provides a interface for controlling the electric valve.
- The water main of the assembled unit needs to be made and mounted on site, and the diameter needs to comply with the design specification.
- The attached Y-shaped filter must be mounted at the water inlet of the evaporator of each unit.
- The net weight in brackets indicates the weight of a dual-condenser heat recovery unit.
- The cooling water and chilled water of the unit must be softened to avoid scaling in the heat exchanger.
- The water pressure drop of the unit does not include resistance of any external water pipe or component.
- Basic modules of the assembled unit are EKWD032CRQRM/S, EKWD043CRQRM/S, EKWD032CRQVM/S, and EKWD043CRQVM/S. A unit may be formed by modules of the same model or different models.
- Product specifications are subject to change due to upgrade without further notice.

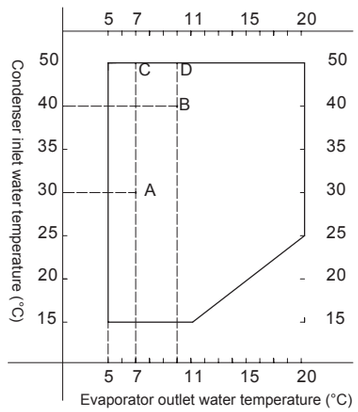
Unit Combinations

Model	EKWD 032CR	EKWD 043CR	Quantity (PCS)	Cooling capacity (kW)		
				Water circulation	Underground circulation	Underground water
32	1	0	1	110	113	115
43	0	1	1	150	153	154
64	2	0	2	220	226	230
75	1	1	2	260	266	269
86	0	2	2	300	306	308
96	3	0	3	330	339	345
107	2	1	3	370	379	384
118	1	2	3	410	419	423
129	0	3	3	450	459	462
139	3	1	4	480	492	499
150	2	2	4	520	532	538
161	1	3	4	560	572	577
172	0	4	4	600	612	616
182	3	2	5	630	645	653
193	2	3	5	670	685	692

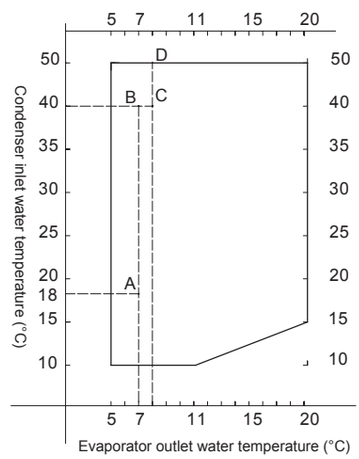
Model	EKWD 032CR	EKWD 043CR	Quantity (PCS)	Cooling capacity (kW)		
				Water circulation	Underground circulation	Underground water
204	1	4	5	710	725	731
215	0	5	5	750	765	770
225	3	3	6	780	798	807
236	2	4	6	820	838	846
247	1	5	6	860	878	885
258	0	6	6	900	918	924
268	3	4	7	930	951	961
279	2	5	7	970	991	1000
290	1	6	7	1010	1031	1039
301	0	7	7	1050	1071	1078
311	3	5	8	1080	1104	1115
322	2	6	8	1120	1144	1154
333	1	7	8	1160	1184	1193
344	0	8	8	1200	1224	1232

Operating temperature range

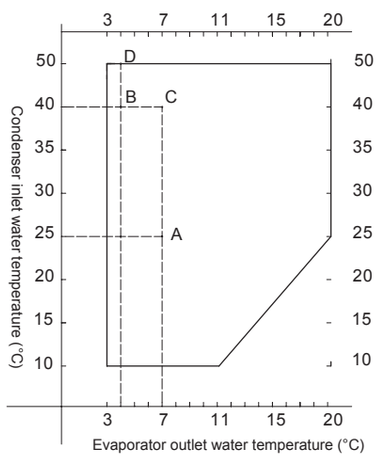
Operating temperature range in water circulation conditions



Operating temperature range for the underground water type



Operating temperature range for the underground circulation type



Note: A, B, C, and D indicate the operating points of rated conditions in cooling mode, heating mode, heat recovery mode, and water heater mode respectively.

In order that the unit is in a favorable operating state, the following conditions should be met:

1. When the unit works in cooling mode, the temperature of the inlet chilled water is within the range from 10°C to 15°C. The inlet water temperature at the heat source side is within the range from 20°C to 35°C in water circulation and underground circulation conditions, and within the range from 15°C to 30°C in underground water conditions.
2. When the unit works in heating mode, the inlet water temperature at the application side is within the range from 35°C to 45°C, and that at the heat source side within the range from 12°C to 20°C.
3. When the unit works in heat recovery mode, the inlet water temperature at the air conditioner side is within the range from 10°C to 15°C, and that at the heat recovery side within the range from 35°C to 50°C.
4. When the unit works in water heater mode, the inlet water temperature at the application side is within the range from 40°C to 50°C, and that at the heat source side (evaporation side) within the range from 12°C to 20°C.

Smart Control for Easy Management >>>

Smart Monitoring

The centralized control system easily implements centralized control for 1 to 16 units to realize balanced wear for compressors, improve the lifecycle of the entire unit, dynamically monitor the running of the unit, and ensure secure operation of the unit. When the unit encounters a fault, the controller can quickly locate the fault and help rectify the fault. The unit sends out smart control signals for the chilled water pump, cooling water pump, and cooling water tower, and may work in free running mode. In addition, the unit can automatically run the system every day in a cycle of a week to implement unattended monitoring.

Unit Alarm and Protection

- Protection (high voltage protection, low voltage protection, compressor overload protection, evaporator antifreeze protection, cooling tower fan overload protection, chilled water flow insufficiency protection, cooling water flow insufficiency protection, chilled water pump overload protection, cooling water pump overload protection, cooling water temperature protection, protection against probe loss, protection against slave unit communication faults, and air exhaust temperature protection) and fault reporting functions
- Controller Locking

Parameter Display

- Unit operating status
- Inlet water temperature
- Outlet water temperature
- Timed setting and antifreeze temperature

Output of Intelligent Control Signals

- Intelligent control signals of the cooling water tower
- Intelligent control signals of the cooling water pump
- Intelligent control signals of the chilled water pump
- Cutoff control signals of the chilled water and cooling water
- Control signals of auxiliary heating

Basic Operating Functions

- Cooling mode
- Heating mode
- Water heater mode
- Heat Recovery Mode

Parameter Setting

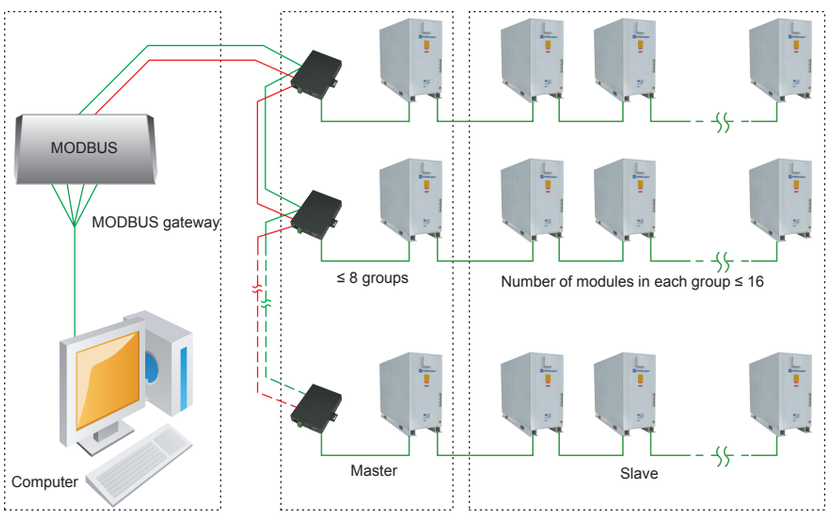
- Time
- Scheduled turn-on/off
- Inlet water temperature for cooling
- Inlet water temperature for heating
- Antifreeze temperature

Other Functions

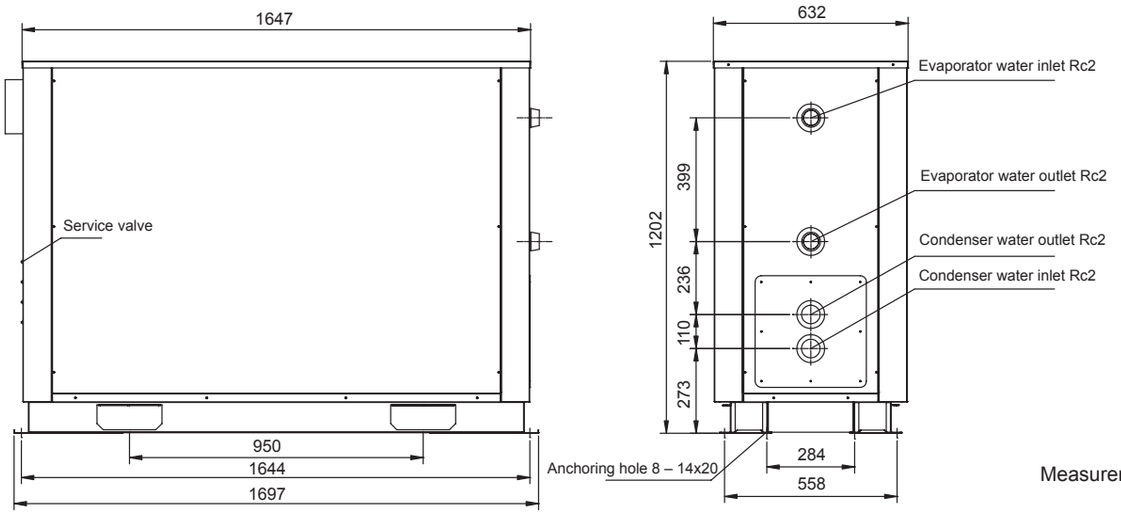
- Fault inquiry
- Compressor balanced wear
- Remote turn-on/off

Centralized Monitoring (Optional)

EK centralized monitoring software can monitor 128 units (in 8 groups, each group consisting of not more than 16 slave units), and connect units to a building system for centralized management. This easily implements smart management, reduces wastes, and saves operating expenses.

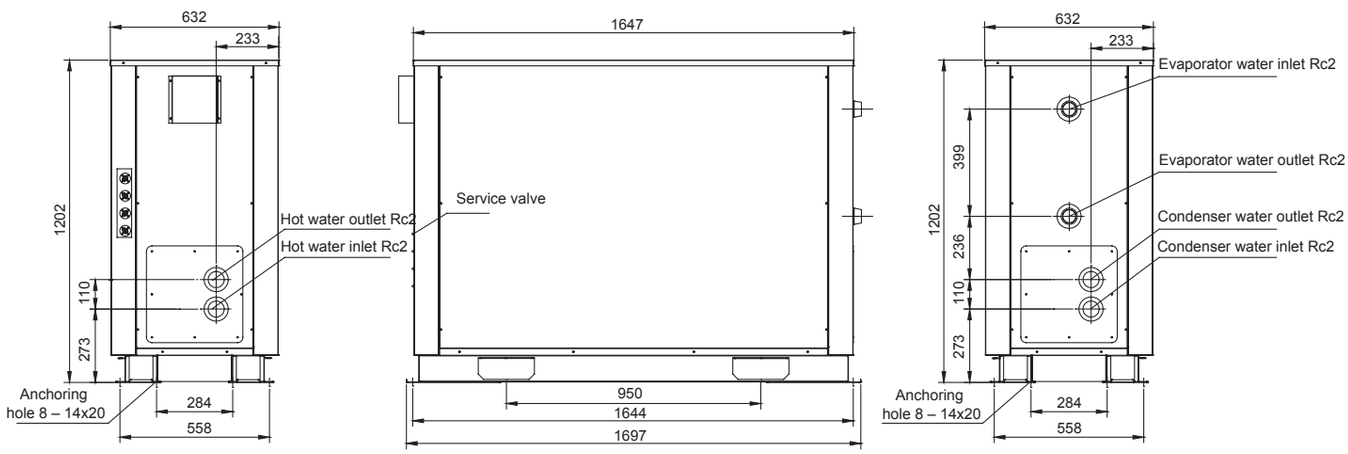


EKWD021CRSQ\EKWD021CRSD\EKWD021CRSG



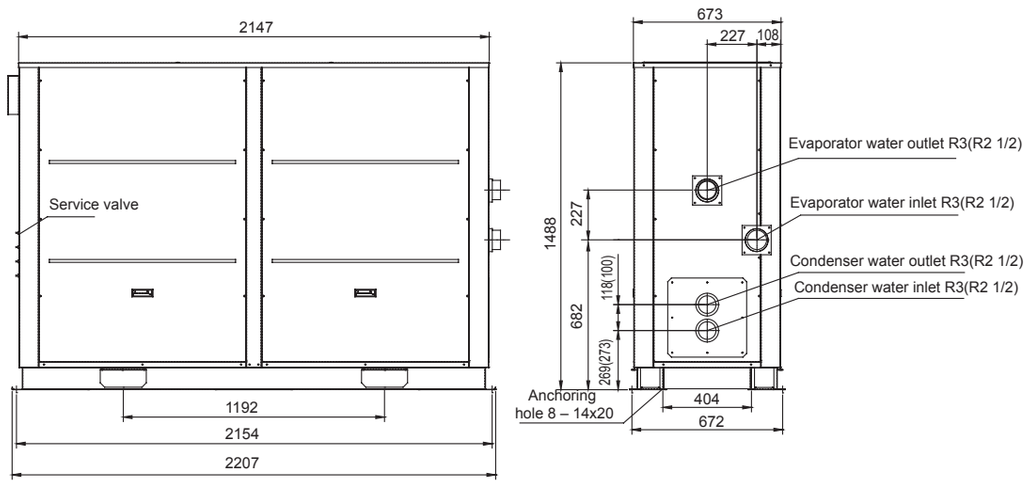
Measurement: mm

EKWD021CRQV\EKWD021CRDV\EKWD021CRGV



Measurement: mm

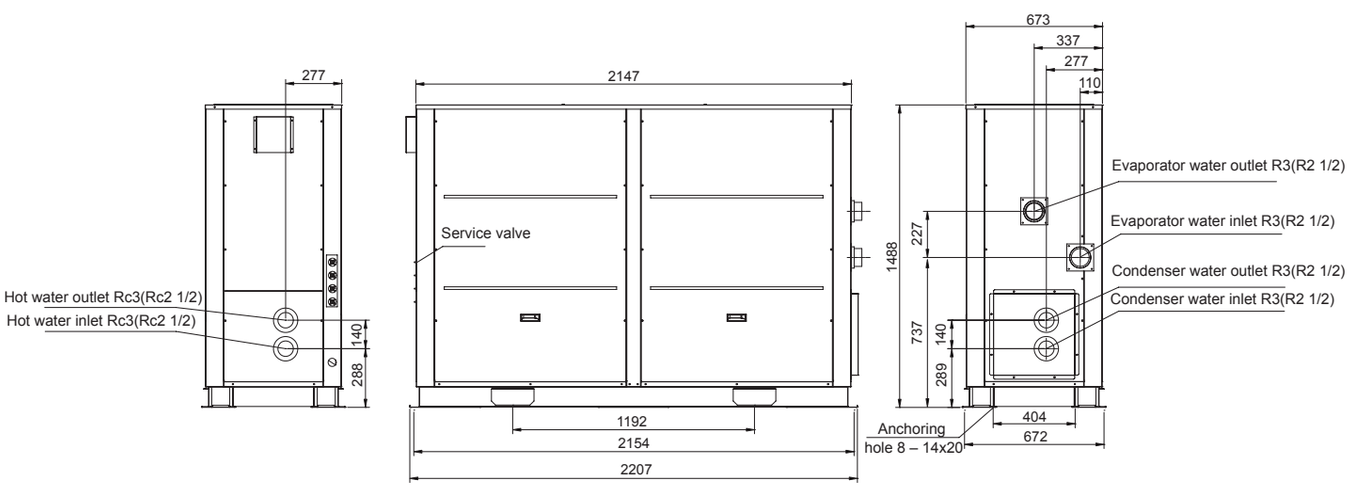
EKWD032CRSQ\EKWD032CRSD\EKWD032CRSG
EKWD043CRSQ\EKWD043CRSD\EKWD043CRSG



Note: Dimensions of the EKWD032CRSQ\SD\SG units are listed in brackets.

Measurement: mm

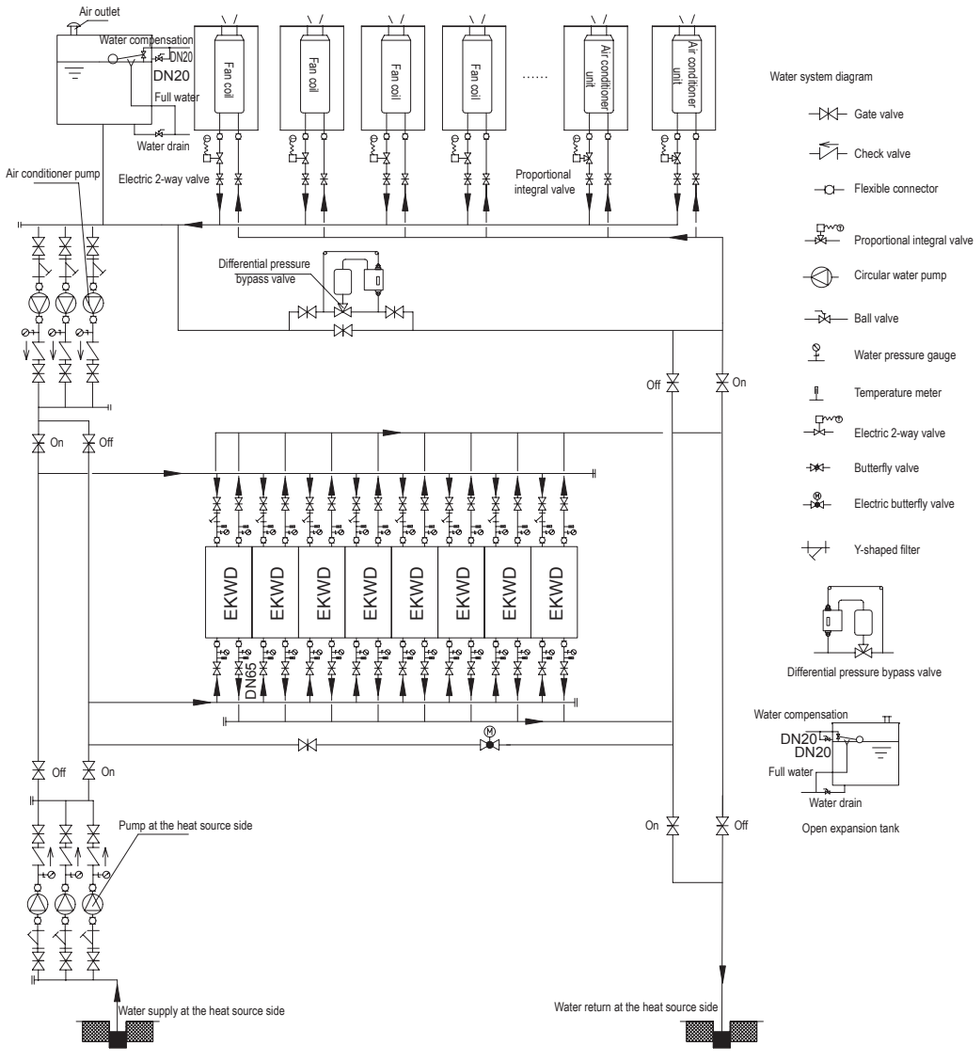
EKWD032CRQV\EKWD032CRDV\EKWD032CRGV
EKWD043CRQV\EKWD043CRDV\EKWD043CRGV



Note: Dimensions of the EKWD032CRQV\DV\GV units are listed in brackets.

Measurement: mm

Reference diagram of the water system



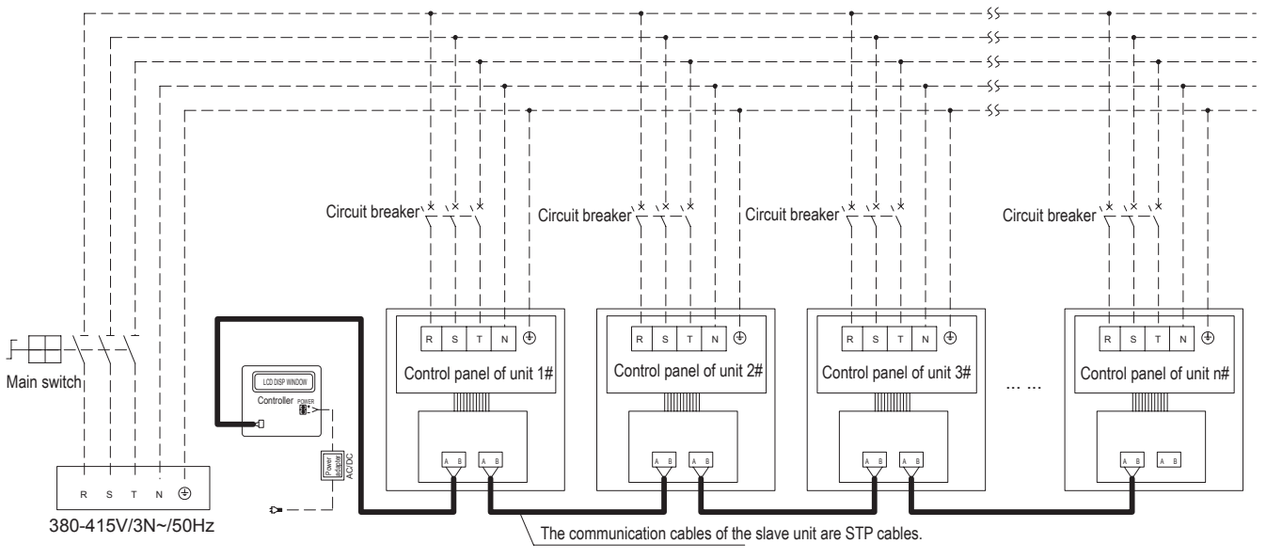
Water Supply Requirements

- It is recommended that the customer check the water system once every 15 days.
- A water supply security valve is a must.
- The water flow cannot be lower than the rated value.
- The top of the water system must be set with an air exhaust valve.
- The bottom of the water system should be set with an appropriate water discharge valve.
- A thermal insulation water tank with a proper volume is recommended to avoid a low load and frequent startup of the unit.
- Softened water is used for circulation. The water quality requirements are listed in the following table.
- An expansion tank must be equipped to adapt to changes of the water volume due to change of water temperature in the water system.
- The water tubes of the unit must be equipped with shunting devices. The water system must be cleaned before water is injected to the system for operation.
- After cleaning and debugging, replace or clean the water sieve of the Y-shaped filter.
- When the cooling capacity of the master unit is the same as that of the slave unit, and the water main uses reverse return connection, the pressure gauge is not required at the inlet or outlet of the water tube.
- As the wire controller can read the inlet and outlet water temperature of each module, the temperature meter is not required.
- The attached Y-shaped filter must be mounted at the water inlet of the evaporator of each unit. A water sieve of not less than 25 meshes must be mounted at the inlet tube of the condenser.
- The cooling water and chilled water of the unit must be softened to avoid severe scaling in the heat exchanger.

Requirements for the circular water quality

	Item	Measurement	Benchmark value		Item	Measurement	Benchmark value
Benchmark item	pH (25°C)	6.5~8.0		Reference	Fe	mg(Fe)/L	<1.0
	Conductivity (25°C)	S/cm	<800		S^{2-}	mg(S^{2}-)/L	Negative
	Cl^-	mg(Cl^-)/L	<200		NH^+	mg(NH^+)/L	<1.0
	SO^{2-}	mg(SO^{2-})/L	<200		SiO_2	mg(SiO^2)/L	<50
	Acid consumption (pH=4.8)	mg($CaCO_3$)/L	<100				
	Total hardness (mg($CaCO_3$)/L)	<200					

Connection diagram of power cables and control cables in master and slave units



Note:

- Cables for the main switch and circuit breaker, and cables shown in the dotted line are not attached with the unit.
- A wire controller is attached with the master unit but not the slave unit.
- The length of the communication cable between the master unit and the wire controller is 40 m. The length of the communication cable attached with the slave unit is 5 m.

Measurement Conversion Table

Length	M	mm	in	ft	mile
	1	$1x10^{3}$	39.37	3.281	$6.214x10^{-4}$
	0.3084	304.8	12	1	$1.578x10^{-5}$
	$1x10^{-3}$	1	$39.337x10^{-3}$	$3.281x10^{-3}$	$6.214x10^{-7}$
	$25.4x10^{-3}$	25.4	1	$0.8333x10^{-3}$	$0.1578x10^{-3}$
	$1.609x10^{3}$	$1.609x10^{6}$	63.36	5280	1
Area	m^2	hm^2	in^2	ft^2	$milk^2$
	1	$1x10^{-4}$	$1.55x10^{3}$	10.76	$3.861x10^{-7}$
	$92.9x10^{-3}$	$9.29x10^{-6}$	144	1	$3.587x10^{-3}$
	$2.59x10^{6}$	258.9	$4.0145x10^{9}$	$2.7878x10^{7}$	1
Volume	m^3	L	US gal	UK gal	ft^3
	1	1000	264.17	219.98	35.315
	$1x10^{-3}$	1	$2.64x10^{-1}$	$2.20x10^{-1}$	$3.532x10^{-2}$
	$3.785x10^{-3}$	3.7853	1	$8.327x10^{-1}$	$1.337x10^{-1}$
	$4.546x1^{-3}$	4.546	1.20095	1	$1.605x10^{-1}$
	$2.832x10^{-2}$	28.316	7.481	6.229	1
Weight	G	kg	t	lb	Slug
	1	$1x10^{-3}$	$1x10^{-6}$	$2.205x10^{-3}$	$6.85x10^{-5}$
	$1x10^{3}$	1	$1x10^{-3}$	2.205	$6.85x10^{-2}$
	$1x10^{6}$	$1x10^{3}$	1	2204.6	68.5
	453.59	$4.5359x10^{-1}$	$4.536x10^{-4}$	1	$3.11x10^{-2}$
	$14.594x10^{3}$	14.5939	$1.46x10^{-2}$	32.174	1
Pressure	Pa	mmH_2O	atm	lb/in^2	in.Hg
	1	$1.0197x10^{-1}$	$9.8692x10^{-6}$	$1.4504x10^{-4}$	$2.953x10^{-4}$
	9.806	1	$9.678x10^{-5}$	$1.422x10^{-3}$	$2.89x10^{-3}$
	101325	10332	1	14.696	29.921
	6894.8	703.06	$6.805x10^{-2}$	1	2.036
	3386.5	345.32	$3.34x10^{-2}$	$4.912x10^{-1}$	1
Energy	J	kJ	kW•h	kcal	Btu
	1	$1x10^{-3}$	$2.778x10^{-7}$	$2.388x10^{-4}$	$9.478x10^{-4}$
	$1x10^{3}$	1	$2.778x10^{-4}$	$2.388x10^{-1}$	$9.478x10^{-1}$
	$3.6x10^{6}$	3600	1	860.1	3413
	4186.8	4.1868	$1.163x10^{-3}$	1	3.968
	1055.1	1.0551	$2.93x10^{-4}$	$2.519x10^{-1}$	1
Power	W	kW	kcal/h	Btu/h	RT
	1	$1x10^{-3}$	$8.60x10^{-1}$	3.413	$2.844x10^{-4}$
	$1x10^{3}$	1	860.1	3413	$2.844x10^{-1}$
	1.1622	$1.1622x10^{-4}$	1	3.968	$3.30x10^{-4}$
	$2.93x10^{-1}$	$2.93x10^{-4}$	$2.52x10^{-1}$	1	$8.33x10^{-5}$
	3516	3.516	3024	12000	1
Flow	L/s	m^3/s	m^3/h	ft^3/s	UK gal/s
	1	1x10-3	3.6	$3.53x10^{-2}$	$2.199x10^{-1}$
	$1x10^{3}$	1	3600	35.3147	$2.1997x10^{2}$
	$2.778x10^{-1}$	$2.778x10^{-4}$	1	$9.81x10^{-3}$	$6.11x10^{-2}$
	$4.719x10^{-1}$	$4.719x10^{-4}$	1.6989	1	6.2288
	$6.309x10^{-2}$	$6.309x10^{-5}$	$2.271x10^{-1}$	$1.605x10^{-1}$	1

Cooling Load Rough Calculation

Building		Cooling load W/m²		Occupants m² / person	Lighting W/m²	Air supply volume L/(s.m²)
		Air supply volume	Sensible cooling load			
Office	Middle	65	95	10	60	5
	Far side	110	160	10	60	6
	Individual office	160	240	15	60	8
	Meeting room	185	270	3	60	9
School	Classroom	130	190	2.5	40	9
	Library	130	190	6	30	9
	Cafeteria	150	260	1.5	30	10
Apartment building	High-rise, facing south	110	160	10	20	10
	High-rise, facing north	80	130	10	20	9
Theater, auditorium		110	260	1	20	12
Laboratory		150	230	10	50	10
Library, museum		95	150	10	40	8
Hospital	Operation room	110	380	6	20	8
	Public area	50	150	10	30	8
Clinic, health center		130	200	10	40	10
Barbershop, beauty salon		110	200	4	50	10
Department store	Basement	150	250	1.5	40	12
	Middle floors	130	225	2	60	10
	Upper floors	110	200	3	40	8
Drug store		110	210	3	30	10
Retail store		110	160	2.5	40	10
Craftwork store		110	160	5	30	10
Computer room		100	200	8	40	5.5
Gymnasium		180	320	1	30	6
Theater		130	220	1	20	7
Single room		90	120	10	60	15
Double room		100	150	10	60	15
Dancing hall (disco)		280	400	1	100	8
Bar		130	260	2	15	10
Chinese food restaurant		220	400	2	60	10
Western food restaurant		160	320	2	60	10
Restaurant	Room	80	130	10	15	7
	Public area	110	160	10	15	8
Factory	Assembly shop	150	260	3.5	45	9
	Light industry	160	260	15	30	10
Arena	Parlor	160	240	6	20	8
	Common matches	110	220	5	40	12
	Open event	110	240	3	80	12

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